REMARKS/ARGUMENTS

The USPTO rejected Claims 1 - 5 and 7 - 12 as being anticipated by EP 0 940 174. In addition, the USPTO rejected Claims 7 - 11 as being anticipated by U.S. Patent Number 5,413,978 ("Kramer"). Further, the USPTO rejected Claim 6 under 35 USC Section 103 as being unpatentable over EP 0 940 174, as applied to Claims 1 - 5 and 7 - 12, and also rejected Claims 1 - 4 under 35 USC Section 103 as being unpatentable over U.S. Patent Number 5,413,978, as applied to Claims 7 - 11, and further in view of either U.S. Patent Number 5,468,700 ("Ward") or U.S. Patent Number 5,883,034 ("Drake"). The inventors respectfully traverse each of these rejections. All claims, as filed, remain in the application.

1. EP 0 940 174. The USPTO asserts that EP 0 940 174 anticipates the process for production of an adsorbent composition that is claimed in the application. The inventors respectfully assert that the EP reference does not disclose a critical element of this process: the mixing of a "highly dispersed" attapulgite binder with a tapped bulk density greater than about 550 g/l with the zeolite product. The applicant assert that this specific type of attapulgite binder is neither taught nor suggested by EP 0 940 174.

The inventors discovered that by mixing a zeolite product with this particular type of "highly dispersed" attapulgite binder, compositions are produced which adsorb a surprisingly greater

percentage of water than would be anticipated based on merely the quantity of attapulgite binder that is utilized. (See page 16, lines 18 - 25 and the results shown in Table 1.) It is clear that the use of "highly dispersed" attapulgite clays in the process of the invention results in significantly higher water adsorption capacity than is possible if only conventionally, dense attapulgite clay binders are utilized.

It is unquestioned the EP 0 940 174 describes only the use of conventional, dense attapulgite clay. Further, there is nothing in the EP reference which would lead a person skilled in the art to suggest that the use of any type of attapulgite binder other than a conventional, dense attapulgite binder would result in an improved adsorbent product. There is certainly nothing to suggest the use of a "highly dispersed" attapulgite clay with this particular adsorption capacity. The portion of the disclosure in the EP reference that is cited by the USPTO to support its assertion that the attapulgite binder of the EP reference is the "highly dispersed" attapulgite of the invention is continued on page 4, lines 36 - 39.

> As the binder in the form of fibers to be used for the adsorbent for separating gases of the present invention, a binder of needle crystals in the form of fibers is preferred to form macropores of the present invention, which contains sepiolite clay or attapulgite clay, and which exists, as a binder, among LSX zeolite particles in the adsorbent. Such clays may be used alone or as a mixture of two or more of them.

Apparently the USPTO is focusing on the concept that the

binder of the EP reference is "in the form of fibers." In fact all attapulgite and sepiolite clays are fibrous in their natural state. (See various articles attached Exhibit 1.) Nothing in the disclosure of the EP reference suggests, however, that the natural attapulgite clay should be processed until it is "highly dispersed." In fact, there is no disclosure even of the type of attapulgite clay that should be used.

The only process that is disclosed in the EP reference for the production of the adsorbent material comprises blending a zeolite powder with "a binder." See col. 5, lines 2, 10, 16, 20 and 23. After the binder and the zeolite materials are blended, they are kneaded, calcined and formed into an appropriate product.

In the examples on pages 9 and 10 of the EP reference, the only process that is disclosed is the addition of either "20 parts by weight of attapulgite clay" or "15 parts by weight of sepiolite clay" to the zeolite. At no point is there disclosed any process to treat the "conventional," dense attapulgite (or sepiolite) clay to make it "highly dispersed."

In contrast, beginning at line 18 on page 9 of the application, the inventors explain that, they "have discovered that a particularly useful blend of zeolites and a clay binder is produced when the clay material is an attapulgite clay which has been 'highly dispersed.'" In that same paragraph, the inventors further state that "clay particles, especially attapulgite clay

particles, [normally] exist as dense materials," which have very limited adsorption capability and tend to form clumps. Only after the attapulgite clay has been "highly dispersed" are these attapulgite clay materials useful. (This is also discussed in detail on page 10 of the application.)

The inventors accordingly assert that the attapulgite clay that is disclosed in EP 0 940 174 is nothing more than a conventional, dense attapulgite clay. There is nothing in the disclosure of EP 0 940 174 that would suggest to a person skilled in the art to process the conventional, dense attapulgite clay into a "highly dispersed" attapulgite clay. In fact, the EP patent states that it does not matter whether the clay that is used is an attapulgite clay or a sepiolite clay. (See page 4, line 38.) The applicant for the EP patent was so little concerned about the nature or processing of the binder, that it did not even mention what type of attapulgite or sepiolite clay that could be utilized as a binder or its process of blending in any of the examples. Further there is no discussion that the attapulgite clay must first be "highly dispersed" before it is useful. In addition, there is no disclosure of the "tapped bulk density" of the binder material that is utilized. Note however, the bulk density of the <u>combined</u> material is discussed in detail. See, page 4, line 58, page 5, line 32, page 9, line 49 and page 10, lines 12 and 37. Thus, the applicant for the EP patent was well aware of the importance of

"bulk density" of the end product. However, it did not recognize that the bulk density of the attapulgite clay binder was also an important factor in producing improved adsorbent products.

An example of conventional, dense attapulgite clay, such as the clay disclosed in EP 0 940 174, is Min-U-Gel® 400 produced by Floridian, which has a bulk density of 26 lbs/ft^2. See Exhibit 2. (When this bulk density amount is converted to metric units, it corresponds to a bulk density 417 g/l. (See Exhibit 3 for conversion into metric units.) As stated in the patent application on page 11, lines 11 - 14, an attapulgite clay with a bulk density in this range is a conventional "dense attapulgite clay" and not a "highly dispersed" attapulgite clay. Unfortunately the bulk density of the attapulgite clay used in the examples of EP 0 940 174 cannot be determined as the applicant failed to identify the type of attapulgite product that was used. This indicates that the bulk density of the attapulgite binder was unimportant to the applicant.

As further support the inventors present the Affidavit of Dr. Armin Pfenninger (Exhibit 4), who states that after review of EP 0 940 172, he believes that it merely "discloses conventional attapulgite clay, similar to the MIN-U-GEL® attapulgite clay...." that is disclosed in the application. Further, Dr. Pfenninger asserts that the attapulgite clay that is disclosed in the EP 0 940 174 is similar to the attapulgite clay that is blended with zeolite

particles and shown in a photograph which is attached as Exhibit A to his Affidavit. As is clear from this photograph, the attapulgite clay fibers are not "highly dispersed," but are rather formed into a clump. This photograph graphically discloses the difference between a "highly dispersed" clay, as shown in the Exhibit B photograph to the Affidavit, and a conventional, non-highly dispersed, dense attapulgite clay, as shown in photograph Exhibit A.

Accordingly, the applicants assert that the disclosure of EP 0 940 174 neither anticipates nor makes any of the claims of the application obvious.

U.S. Patent No. 5,413,978. ("Kramer")

In a similar manner, the USPTO assets that Kramer anticipates several of the claims of the application. In support thereof, the Examiner asserts that the "tapped bulk density" of the attapulgite clay, as claimed, is disclosed at col. 3, lines 60 - 69 of Kramer. The Examiner asserts that because the clay has the required bulk density, the water absorption capacity would inherently be the same." (Office Action page 4, lines 5 - 7.)

The inventors respectfully assert that the Examiner has misread Kramer. The product with a bulk density of 0.7 to 0.9 g/cc in trama is not the attapulgite clay binder, but rather the end product, i.e. "the dustless, free flowing products of the

invention." See col. 3, line 60. In contrast, the bulk density of the attapulgite clay alone is disclosed, at col. 4, lines 52 - 53, where Kramer states that "[t]he attapulgite clay starting material should have a bulk density of at least about 30 lbs/cu. ft." The conversion factor to convert "lb/ft^3" to "g/l" is to multiply by a factor of 16.02. (See the conversion chart, attached as Exhibit 3.) Thus, the bulk density of the attapulgite clay alone that is taught in Kramer is 480 g/l, which is within the range of "dense attapulgite clay binders" as described by the inventors on page 11, lines 11 - 14 of the application, where it states "[d]ense attapulgite clay binders... have a tapped bulk density of about 400 g/l to about 530 g/l." (Emphasis supplied.) Accordingly, the attapulgite clay that is disclosed in Kramer is not a "highly dispersed" attapulgite clay, as claimed by the inventors. Rather, the type of attapulgite clay as described by Kramer are an "uncalcined run-of-mine crude attapulgite clay...." Col. 3, lines 23 - 24 or "attapulgite crude clay", Col 8. lines 38-9. Accordingly, there is no suggestion that the attapulgite clay of Kramer is a "highly dispersed" attapulgite clay. In fact, what is taught by Kramer is merely a conventional, dense attapulgite clay.

That Kramer uses a non-highly dispersed, conventional, dense attapulgite clay is further opined by Dr. Pfenninger in his Affidavit, Exhibit 4, paragraph 7.

Finally, Kramer can not form the basis for a rejection based

on 35 USC Section 102 as it fails to disclose the use of zeolites, a required element of each claim of the application. Rather, Kramer only teaches the use of a portland cement material. (See col. 3, lines 29 - 32.) No person skilled in the art would be taught to use a "highly dispersed" attapulgite clay as required and claimed from the disclosure of Kramer.

It is not necessary to discuss the teachings of Ward or Drake as neither are cited as teaching the use of a "highly dispersed" attapulgite clay blended with a zeolite material.

CONCLUSION

As neither Kramer nor EP 0 940 174 disclose the use of a "highly dispersed" attapulgite clay, they do not support a rejection under either 35 USC Section 102 or 35 USC Section 103. Accordingly, the inventors respectfully assert that all claims are allowable over the references cited.

The inventors request that this Response be carefully reviewed and all claims be allowed. If there are any questions concerning this Response, please contact inventors' counsel.

Respectfully submitted,

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Dated: August 11, 2003 Holly Adams

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